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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/990,862	11/13/2001	Jung-Yu Hsieh	JCLA7288	2708
7590	10/28/2003		EXAMINER	
J. C. Patents, Inc. Suite 250 4 Venture Irvine, CA 92618			LE, THAO X	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 10/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/990,862

Applicant(s)

HSIEH ET AL.

Examin r

Thao X Le

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-8 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-8 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 3, 5, 7-8, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6383873 to Hegde et al in view of US Pub 2001/0028582 to Tarui et al.

Regarding to claims 1, 7, Hegde discloses a structure of a transistor in fig. 5 comprising: a first oxide layer 104, column 2 line 17, positioned on the substrate 102, a dielectric layer 106 having a high dielectric constant, column 2 line 24-33, positioned on the first oxide layer 104, a second oxide layer 108, column 3 line 20, positioned on the dielectric layer 106 having the high dielectric constant, wherein the first oxide layer, the dielectric layer having the high dielectric

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constant layer and the second oxide layer together form a charge trapping layer, wherein the dielectric layer having high dielectric constant is selected from the group consisting of $\text{Hf}_x\text{Si}_y\text{O}_z$, column 1 line 20, a gate 110, column 4 line 6, located on the second oxide layer 108 of the charge trapping layer, and a source /drain 124 region located at two lateral sides of the substrate 102.

But, Hegde does not expressly disclose the transistor for flash memory. However, the transistor disclosed by Hegde can be used in different applications such as flash memory or transistor device. Therefore, it would have been obvious to use Hedge's structure in the flash memory as claimed.

Although the prior art does not specially disclose the first oxide layer, the dielectric layer having the high dielectric constant layer and the second oxide layer together form a charge trapping layer, this feature is seen to be obvious teaching of that limitation, when the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent or obvious, because when the claimed and the prior art products are identical or substantially identical in structure or composition, such charge trapping layer has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977). Furthermore, Yoshikawa confirmed such structure in US 6335554.

Furthermore, Tarui reference discloses the high dielectric material 4 can be ZrO_2 , HfO_2 or Y_2O_3 [0035]. At the time of the invention was made; it would have been obvious to one of ordinary skill in the art to use the dielectric teaching of Tarui with Hegde,

because such material substitution would have been considered a mere substitution of art-recognized equivalent values.

Regarding to claims 3, 5, 8, 11 Hegde discloses a structure of a flash memory wherein the dielectric constant of the $\text{Hf}_x\text{Si}_y\text{O}_z$ (commonly known as hafnium silicates) dielectric layer 106 having high dielectric constant is greater than 8, wherein the band gap of the dielectric layer 106 having the high dielectric constant is larger than that of silicon oxide,

Although the prior art does not specially disclose the high dielectric layer 106 having dielectric constant greater than 8 and the band gap larger than that of silicon oxide constant, this feature is seen to be inherent teaching of that limitation, when the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent, such high dielectric constant is greater than 8 or larger band gap of $\text{Hf}_x\text{Si}_y\text{O}$ than silicon oxide has been established. *In re Best*, 195 USPQ 430, 433 (CCPA 1977). Furthermore, the dielectric constant of hafnium silicates is larger than 8 is confirmed in 6518610 to Yang et al., column 4 line 16.

Response to Arguments

4. Applicant's arguments filed 09/29/03 have been fully considered but they are not persuasive. The Applicant argues that Hedge does not disclose the dielectric layer consisting of HfSi_xO_y . This is not persuasive because Hedge discloses typical high dielectric constant of metal oxides include ZrO_2 , HfO_2 , or $\text{Hf}_x\text{Si}_y\text{O}_z$, column 1 lines 18-20.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X Le whose telephone number is 703-306-0208. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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Thao X. Le
October 16, 2003

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